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Descriptions of three new species of the genus *Osphya* Illiger (Coleoptera: Tenebrionoidea: Osphyidae) from western Yunnan, China

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Abstract: Three new species of the genus *Osphya* Illiger (Coleoptera: Osphyidae) are herein described from the western part of Yunnan Province, China: *Osphya flavomarginata* **sp. nov.** (type locality: Tiechang, Yunlong County), *Osphya azurea* **sp. nov.** (type locality: Maji, Fugong County), and *Osphya clavata* **sp. nov.** (type locality: Xima, Yingjiang County). Comparisons to their related species, keys for their identification, as well as the diagnosis of the genus *Osphya* are provided.

Keywords: China, new species, Oriental, Osphyidae

云南省西部殿甲属 *Osphya* 三新种（鞘翅目：拟步甲总科：殿甲科）

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摘要：本文描述了采自中国云南省西部的殿甲科 Osphyidae 殿甲属 *Osphya* 三新种：黄缘殿甲 *Osphya flavomarginata* **sp. nov.**（模式产地：云龙县铁厂村）、蓝翅殿甲 *Osphya azurea* **sp. nov.**（模式产地：福贡县马吉乡）、棒角殿甲 *Osphya clavata* **sp. nov.**（模式产地：盈江县昔马镇）。文中提供了这三个新种与近缘种的详细形态比对及分类检索表，并对殿甲属的识别要点进行了简述。

关键词：中国，新种，东洋区，殿甲科

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Introduction

The family Osphyidae Mulsant, 1856, a small group within the superfamily Tenebrionoidea, consists of only two genera and approximately 30 species (Nikitsky 2020; Liu H *et al*. 2023). For a long period since Crowson (1966), it was classified as a subfamily of Melandryidae. However, a phylogenetic study grounded in molecular data indicates that Melandryidae is polyphyletic, and thus, the family Osphyidae ought to be resurrected (Cosandey *et al*. 2024).

Prior to the present study, the genus *Osphya* Illiger, 1807 contained a total of 28 species, constituting the majority within the family (Liu H *et al*. 2023). This genus exhibits a broad yet discontinuous distribution across the temperate and subtropical regions of the northern hemisphere (Liu T *et al*. 2023). Although the majority of recorded collection localities are from the Western Palaearctic, the Oriental Realm (encompassing the southern part of the Eastern Palaearctic as well) has the greatest species richness. In the Oriental and Eastern Palaearctic, a total of 13 species have been described (Liu H *et al*. 2023). These species are scattered from East Asia to India and Indo-China, yet they do not extend to the Malay Archipelago. Among the remaining 15 species, nine are distributed in the Western Palaearctic (Nikitsky 2020), and six in the Nearctic (Pollock 2002).

Most species of the genus have been inadequately described in the literature, and no revisionary work on this genus has been published. Species determination within specific faunae can refer to the keys for the Oriental and Eastern Palaearctic Realms (Liu H *et al*. 2023), Iberia (Recalde Irurzun *et al*. 2017), and the United States (Van Dyke 1928). The male genitalia of the genus have also been scarcely described or illustrated in publications, with the exception of the following species: *O. sinensis* Liu & Yang, 2023 (Liu H *et al*. 2023); *O. aeneipennis* Kriechbaumer, 1848 and *O. vandalitiae* (Kraatz, 1868) (Recalde Irurzun *et al*. 2017); *O. bipunctata* (Fabricius, 1775), *O. lehnertae* Konvička, 2014, and *O. brusteli* Konvička, 2016 (Konvička 2014, 2016).

Recently, the author received three *Osphya* specimens, all collected from the western part of Yunnan by different collectors. Fortunately, all of them are males and represent three distinct new species. Therefore, the primary objective of this paper is to describe these three new species, accompanied by comprehensive descriptions, illustrations of habitus and male terminalia, comparisons with related and similar species, and an enhanced key to incorporate these three new species and their relatives. The discovery of these new species raises the global species count of this genus to 31 and represents the second record of this family in mainland China.

Material and methods

Specimen examined in this study were deposited in the Collection of Forest Entomology Laboratory, Beijing Forestry University, Beijing, China (**CBFU**).

All images of habitus, external, and male genitalia characters were taken by a Nikon SMZ-18 stereoscopic dissecting microscope fitted with a Nikon D7500 camera. For each final image, several photographs were taken at different focal planes and combined with Helicon Focus software to get one synthesized photograph.

Measurements and abbreviations are as follows: the width of head (HW) was measured along the outer margin of eyes; the length of pronotum (PL) was measured along median line; the width of pronotum (PW) was measured along maximum width of pronotum; the length of body (BL) was the linear distance from the apex of labrum to elytral sutural end. A1–A11 were abbreviated for antennomeres 1–11.

The terminologies for male genitalia adopted here are based on those presented in Lawrence & Ślipiński (2013: 61). Other morphological terms generally adhere to their common usages within the genus *Osphya* (Recalde Irurzun *et al*. 2017; Liu H *et al*. 2023). Nevertheless, it should be noted that some of the terms regarding the apical abdominal segments used in these studies are inappropriate and will be corrected in the present paper. Specifically, “ventrite VI” should be corrected to ***sternite VIII***, because this segment is externally invisible and the term ventrite is only used to refer to the visible ventral sclerite of the abdomen. Meanwhile, “tergite V” and “tergite VI” need to be corrected to ***tergite VII*** and ***tergite VIII*** respectively, because the term tergite is only used to describe the actual

segmentation of the dorsal sclerites of abdomen. Other terms for male genitalia applied in this paper should be elucidated as follows: ***basale*** refers to the phallobase that articulates with the apicale; ***apicale*** is the parameral piece formed by the fusion of parameres; ***parameres*** only refers to the apical part of the apicale that is separated by the apical cleft; ***tegmen*** refers to the structure composed jointly of the basale and the apicale; and ***penis*** refers to the median lobe of the aedeagus.

Taxonomy

Family Osphyidae Mulsant, 1856

Genus *Osphya* Illiger, 1807

Osphya Illiger, 1807b: 330; Illiger, 1807c: 370 (unnecessary replacement name for *Pelecina* Illiger, 1807); Mulsant 1856: 108 (validated for *Osphya* as First Reviser).

Pelecina Illiger, 1807a: 300. **Type species** *Cantharis bipunctata* Fabricius, 1775, by monotypy.

Nothus Olivier, 1812: 384. **Type species** *Nothus clavipes* Olivier, 1811 (= *Cantharis bipunctata* Fabricius, 1775), by subsequent designation of Westwood 1838: 31.

Diagnostic characters. Small to medium sized beetles; body form relatively elongate, typically with parallel lateral sides; some species with metallic coloration; dorsum covered with dense recumbent setae, forming pale pattern on elytra in some species. Head distinctly constricted behind eyes; eyes deeply incised along their anterior margin, antennae inserted within these incisions; antennae 11-segmented; apical segments of both labial and maxillary palpi strongly enlarged. Pronotum quadrate, semicircular or oval, usually with a pair of latero-basal depressions; prosternum short, prosternal process short, protrochantins exposed. Femora and tibiae sexually dimorphic in many species; penultimate tarsomeres distinctly lobed; tarsal claws strongly toothed (trident, with a split apex and a basal tooth, Figs 1F, G). Male abdominal segment IX desclerotised, only the spiculum gastrale remained (Figs 2E; 3E; 4E). Tegmen very long; parameres distinctly separated and setose apically; basale and apicale articulated.

Recognition. Adults of *Osphya* can be identified from other heteromerous families by the diagnostic characters mentioned above, especially the deeply incised eyes and the lobed penultimate tarsomeres. Considering these two crucial traits, *Osphya* might be confused only with the family Scraptiidae, some members of the family Oedemeridae (especially the subfamily Calopodinae and tribe Ditylini), or the subtribe Alleculina (Tenebrionidae). From Scraptiidae, *Osphya* can be readily distinguished by the head constricted behind eyes but not forming abruptly narrowed neck; from Oedemeridae, *Osphya* is distinguished by the pronotum depressed with complete lateral carinae; and from Alleculina, *Osphya* is distinguished by the claws toothed but not pectinate.

Species within the genus *Osphya* are soft-bodied beetles and somewhat resemble those of Cantharidae (Fig. 1A), Oedemeridae (Fig. 1B), Alleculinae (Fig. 1C), or some other families in their general appearances. Those cantharid-like or oedemerid-like species of *Osphya* may be engaged in mimicry of these toxic beetles, but can be readily distinguished from the beetles they mimic by the characters on the eyes and tarsi.

Finally, regarding *Conopalpus* Gyllenhal, 1810, the sole other genus in Osphyidae, it differs from *Osphya* by the antennae with only ten antennomeres, eyes with interfacetal setae, and claws with only the basal tooth.

Biology. The information of habitat for these three new species was not recorded by the collectors. Some European species have been documented to inhabit the flowers of various plant families, such as Rosaceae, Apiaceae, and Rubiaceae, in meadows during May and early June (Konvička 2014, 2016).

Key to the *Osphya* species in the Oriental and eastern Palaearctic Realms (modified from Liu H *et al*. 2023)

1. Elytra blue or green, with distinct metallic hue **2**
Elytra black, yellow or reddish brown, at most with a very faint metallic lustre **5**

2. Larger sized species, BL = 12 mm; legs uniformly yellowish brown. N. Vietnam ..... ***O. superba*** Pic, 1927
Smaller sized species, BL = 7.7–10 mm; legs bicolored or entirely dark **3**

3. Elytra dark blue; apical antennomeres and pronotum both entirely dark (Fig. 1B); China (Yunnan: Fugong) ..... ***O. azurea* sp. nov.**
Elytra green or greenish blue; antennae bicolored, with apical four antennomeres yellow; pronotum partly light colored **4**

4. Legs partly light colored; pronotum with a smaller dark area, restricted on disc, not reaching anterior or lateral margins; male metatibiae simply curved, without preapical denticle. China (Hubei) ..... ***O. sinensis*** Liu & Yang, 2023
Legs entirely dark; pronotum with a larger dark area, reaching anterior margin and anterior half of lateral margins (Fig. 1A); male metatibiae with a large denticle on apical fifth of inner margin (Fig. 1D). China (Yunnan: Yunlong) ..... ***O. flavomarginata* sp. nov.**

5. Elytra black, with thickened recumbent setae forming distinct whitish fasciae or strips **6**
Elytra only with fine setae, or with evenly distributed thickened whitish setae, not forming distinct pattern ..... other species of *Osphya*
[These eight species are not related to the new species described in the present paper. Their determination can be referred to their original descriptions or the key provided by Liu H *et al*. (2023)]

6. Pronotum distinctly transverse, well-rounded at lateral sides; A5 in similar length of A2; antennae predominantly yellow, gradually infuscate to apical antennomeres **7**
Pronotum slightly transverse, lateral sides subparallel or narrowing to front; A5 distinctly longer than A2; antennae infuscate on middle antennomeres, gradually lightened to apical antennomeres **8**

7. Pronotum reddish brown; all legs reddish brown; antennae filiform, apical antennomeres not thickened, A6–A9 elongate; pronotum with deep latero-basal depressions. India (Assam) ... ***O. albofasciata*** Champion, 1916
Pronotum black; protibiae and protarsi light yellow, other parts of legs black; antennae claviform, gradually shortened and thickened since A5, A6–A9 with width similar to their length; pronotum with latero-basal depressions hardly recognizable. China (Yunnan: Yingjiang) ..... ***O. clavata* sp. nov.**

8. Elytra with three longitudinal whitish strips along suture and on disc of each elytron. China (Taiwan) ..... ***O. trilineata*** Pic, 1910
Elytra with three transverse whitish bands near anterior third, apical third and apex of elytra, in some specimens, these bands only faintly defined. Japan ..... ***O. orientalis*** (Lewis, 1895)

Osphya flavomarginata sp. nov. 黄缘殿甲

https://zoobank.org/F1038187-405E-45B1-8E2D-8BB3E4102517
Figs 1A, D; 2

Type. Holotype: male (CBFU): “Yunnan, Dali Pref., Yunlong County, Caojian Town, Tiechang Village. 2022.VI-VIII, Zuo Zhi-Wu leg.” [in Chinese]

Diagnostic characters. Body form very slender, BL = 7.7 mm; antennae bicolored, apical four segments yellow; pronotum basally yellow, yellow region along posterior margin and basal half of lateral margins; elytra metallic green with golden recumbent setae; male metatibiae distinctly curved, inner margin with a large denticle on apical fifth of inner margin; male tergite VII truncate and slightly emarginate apically; apices of paramere hooked; apex of penis very strongly bent downward.

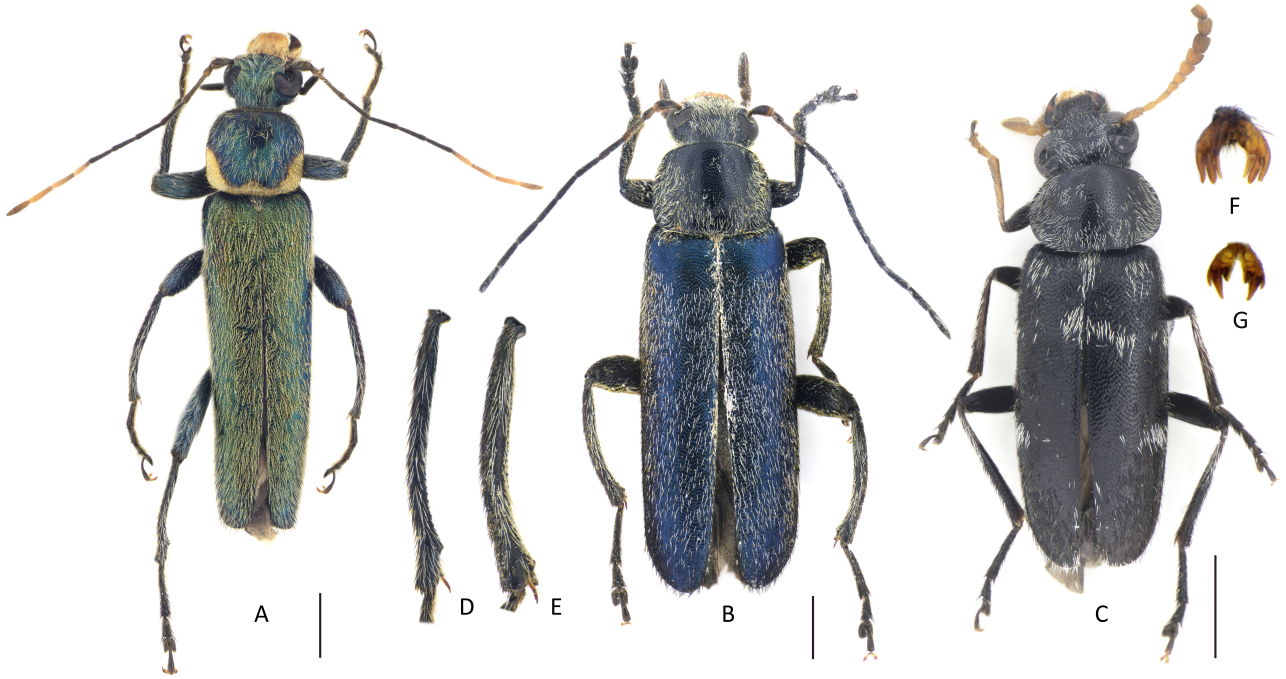

FIGURE 1. A habitus of *Osphya flavomarginata* **sp. nov.** (holotype) **B** habitus of *Osphya azurea* **sp. nov.** (holotype) **C** habitus of *Osphya clavata* **sp. nov.** (holotype) **D** metatibia of *Osphya flavomarginata* **sp. nov. E** metatibia of *Osphya azurea* **sp. nov. F** tarsal claw of proleg, *Osphya flavomarginata* **sp. nov. G** tarsal claw of metaleg, *Osphya clavata* **sp. nov.** Scale bars = 1.0 mm for figs A–C.

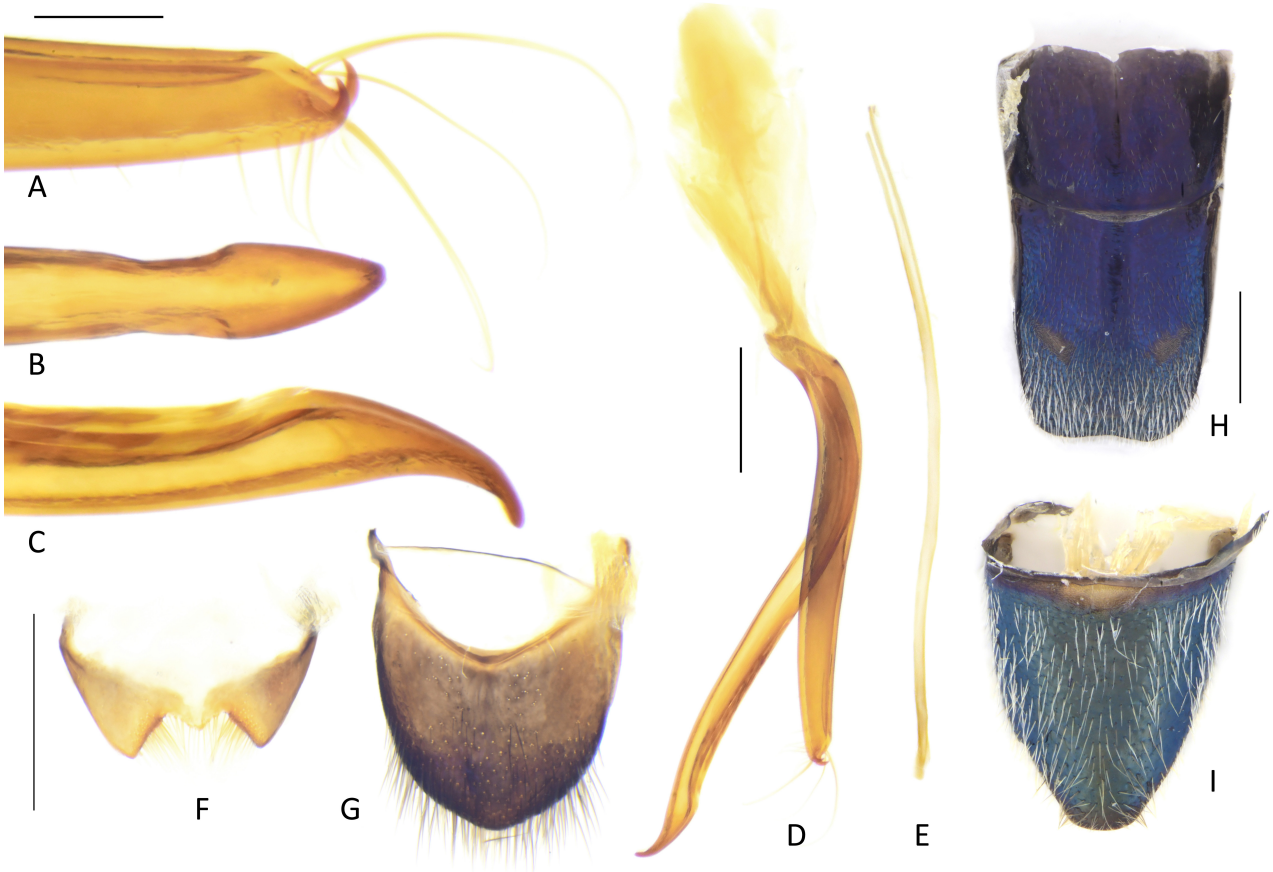

FIGURE 2. *Osphya flavomarginata* **sp. nov. A** apices of parameres, lateral view **B** apex of penis, dorsal view **C** apex of penis, lateral view **D** aedeagus, lateral view **E** sternite IX **F** sternite VIII **G** tergite VIII **H** tergite VI–VII **I** sternite VII. Scale bars = 0.2 mm for figs A–C, = 0.5 mm for figs D–I.

Comparison. From the general habitus, the new species is most similar to *O. sinensis* Liu & Yang from Hubei. Both species share a narrow body form, a partly yellow pronotum, bicolored antennae, and curved metatibiae in males. Although the females of the new species remain unknown, the males of these two species have the following significant differences: (1) In *O. flavomarginata* **sp. nov.**, pronotum largely metallic green, only with very narrow yellow band along posterior margin and basal half of lateral margins (Fig. 1A); whereas in *O. sinensis*, dark pattern much smaller, restricted at center of disc. (2) In *O. flavomarginata* **sp. nov.**, legs entirely dark; whereas in *O. sinensis*, meso- and metafemora bicolored. (3) In *O. flavomarginata* **sp. nov.**, elytra covered with golden recumbent setae; whereas in *O. sinensis*, elytra with grayish recumbent setae. (4) Body size of *O. flavomarginata* **sp. nov.** much smaller, BL = 7.7 mm (versus 9.5–10.0 mm in *O. sinensis*). (5) In *O. flavomarginata* **sp. nov.**, male metatibiae with a large denticle on apical fifth of inner margin (Fig. 1D); whereas in *O. sinensis*, male metatibiae simply curved without such preapical denticle. (6) In male genitalia of *O. flavomarginata* **sp. nov.** (Figs 2C, D), apex of penis much more strongly bent downward than in *O. sinensis*. (7) In *O. flavomarginata* **sp. nov.**, apex of male tergite VII truncated and slightly emarginate (Fig. 2H); whereas in *O. sinensis*, apex of male tergite VII curved.

For the similar shape of the male tergite VII (truncated and emarginate, Figs 2H; 3H) and the apex of the penis (strongly bent downward, Figs 2C; 3A), *O. flavomarginata* **sp. nov.** is considered to be most related to another new species described below, *O. azurea* **sp. nov.**, but not to *O. sinensis*. The comparisons between them are provided under *O. azurea* **sp. nov.**

The last *Osphya* species from the Oriental Realm with a distinct metallic hue on elytra is the very little-known species *O. superba* Pic, 1927 from North Vietnam. Based on the brief original description (Pic 1927a), it can be found that *O. superba* is different from the present new species by: all legs entirely yellowish brown; body size much larger (BL = 12 mm vs 7.7 mm); elytra covered with whitish recumbent setae; pronotum yellow with dark median line and lateral patches.

Besides the species discussed above, there are no other similar species from the Oriental and Eastern Palaearctic with a strong metallic hue on the elytra. For these metallic species from the western Palaearctic, such as *O. aeneipennis* Kriechbaumer, they all differ from the present new species in having a much wider body form, more rounded pronotum, and different characters on the male metatibiae.

Description. Based on unique male holotype (Fig. 1A). BL = 7.7 mm; body form much slenderer than typical in genus. Dorsum with strong metallic hue, copperish green on elytra, bluish green on head and pronotum. Labrum and clypeus entirely pale yellow; mandibles dark brown at apex, yellow near base; palpomeres black. Antennae distinctly bicolored, basal seven segments dark colored, A4–A7 black, A1–A3 slightly lighter than them; A8–A11 light colored, A8–A10 slightly darkened to base, A11 slightly darkened to apex. Pronotum with an undulate yellow basal marginal band, reaching entire posterior margin and basal half of lateral margins. Head and pronotum covered with cream white recumbent setae; elytra with much denser and more thickened golden recumbent setae. Legs dark metallic green, except claws which yellowish brown. Ventral side metallic green, densely covered with cream white recumbent setae.

Head large and wide; mandibles bifid at apex, both with a large and sharp preapical tooth on inner margin, densely setose on basal half of outer surface, with a few setae extended to middle part of outer edge; apical maxillary palpomere very strongly securiform, slightly shorter than two previous ones together. Antennae long and slender, A2 very small, length about 1.5 times of its width; A3 about 3.5 times as long as A2; A4 and A5 slightly shorter than A3; A6–A10 similar to each other and shorter than A5; A11 fusiform, gradually tapered to apex.

Pronotum nearly quadrate, slightly wider than length (PW/PL = 1.20), wider than head (PW/HW = 1.22); lateral margins parallel on their posterior half, arched on anterior half, forming widely rounded anterior angels, widest point near middle; posterior margin straight in middle; posterior angles rounded-rectangular. With evenly arranged punctures on disc, but these punctures almost invisible on pale region; distance between punctures generally greater than their diameter; each puncture bearing a cream white recumbent setae. Lateral area explanate near posterior angles, declining near anterior angles. All margins distinctly bordered; with a pair of well-defined

latero-basal depressions, forming oblique short furrows between pale and dark regions, connecting to posterior border.

Elytra very narrow, gradually narrowed to apex; much more densely punctate than on pronotum, punctures dense and somewhat tangled near base, slightly finer and sparser towards elytra apex. Elytra with very dense, thickened golden recumbent setae; these setae evenly distributed and not forming a pattern; also with blackish recumbent setae but only restricted to elytral apices and humeral regions. Scutellar shield triangular, densely covered with golden setae.

Legs modified in males; meso- and metafemora thickened; mesotibiae curved without denticle or crenulation on inner margin; metatibiae more strongly curved, inner margin with a large denticle on apical fifth, crenulate between midpoint and preapical denticle, outer margin bisinuate near preapical denticle on inner margin (Fig. 1D); metatarsomere 1 in similar length of rest three tarsomeres together; all claws trident, middle branch slightly longer than lateral ones on pro- and mesoclaws (Fig. 1F), distinctly longer than them on metaclaws (as in Fig. 1G).

Male terminalia: Sternite VII elongate and tapered to apex (Fig. 2I); tergite VII quadrate, apex truncated and emarginate, with dense whitish setae on apical fourth and a pair of oblique triangular pilous patches on each side behind middle (Fig. 2H); sternite VIII bilobate, each lobe widely triangular and with long setae on inner-apical margin (Fig. 2F); apical margin of tergite VIII arched and very faintly protruding in middle (Fig. 2G). Tegmen with basale about half length of apicale (Fig. 2D); middle portion of apicale hardly sinuate in lateral view; apical cleft about half length of apicale; parameres strongly hooked, apices very sharp and strongly curved inwardly, with three long setae on notch before apical hook of dorsal margin, and some shorter setae on ventral margin (Fig. 2A). Penis arched near base, gradually sinuate near middle, apex capitate and strongly bent downward (Figs 2B, C).

Etymology. The scientific name of the new species is derived from the Latin roots "*flav-*", which means yellow, and "*margin-*", which means margin. The specific name refers to the distinctive narrow yellow margin on the base of pronotum for the new species.

Distribution. The new species is only known from the type locality Tiechang Village in Yunlong County (Fig. 5, red), on the south section of Nushan mountain range in western Yunnan. The elevation is around 2300 m.

***Osphya azurea* sp. nov. 蓝翅殿甲**

https://zoobank.org/8D90AAF7-57B2-4215-A6CE-54A3CC9C93D3

Figs 1B, E; 3

Type. Holotype: male (CBFU): "Yunnan, Fugong County, Maji Xiang, June 2024, 2400-2600 m, Li Bai-Jun leg" [in Chinese]

Diagnostic characters. Body form slender, BL = 8.1 mm; antennae dark colored, slightly brown on basal three segments; pronotum, elytra, and legs entirely dark; elytra metallic blue with mixed whitish and blackish recumbent setae; male metatibiae distinctly curved, with an obtuse denticle near apex of inner margin; male tergite VII truncate and slightly emarginate apically; apices of paramere hooked; apex of penis very strongly bent downward.

Comparison. The new species can be easily distinguished from all other congeners from the Oriental and eastern Palaearctic Realms by its entirely dark body with metallic blue elytra. Based on the similar shape of male tergite VII and apex of penis, *O. azurea* **sp. nov.** is considered to be most closely related to *O. flavomarginata* **sp. nov.** In addition to their different coloration on antennae, pronotum, and elytra, the males of these two new species are also different in the following important aspects: (1) In *O. azurea* **sp. nov.**, elytra covered with whitish and blackish recumbent setae, two-colored setae evenly intermingled across entire elytral surface; whereas in *O. flavomarginata* **sp. nov.**, blackish setae restricted to elytral apices and humeral regions. (2) In *O. azurea* **sp. nov.**, male metatibiae with an obtuse denticle near apex of inner margin, outer margin evenly curved (Fig. 1E); whereas in *O. flavomarginata* **sp. nov.**, male metatibiae with a larger and sharper denticle more distant from apex of inner margin, outer margin distinctly bisinuate near preapical denticle (Fig. 1D). (3) Body form of *O. azurea* **sp. nov.** much wider than *O. flavomarginata* **sp. nov.** (4) In *O. azurea* **sp. nov.**, male tergite VIII distinctly angulate at apex

(Fig. 3F); whereas in *O. flavomarginata* **sp. nov.**, male tergite VIII evenly curved at apex (Fig. 2G). (5) In *O. azurea* **sp. nov.**, middle portion of apicale (when in lateral view) more sinuate than in *O. flavomarginata* **sp. nov.** (6) Apical hooks of parameres shorter and wider in *O. azurea* **sp. nov.** (Fig. 3A) (7) Apex of penis strongly and evenly bent downward in *O. azurea* **sp. nov.** (Fig. 3A); whereas in *O. flavomarginata* **sp. nov.**, apex of penis abruptly bent downward (Fig. 2C).

FIGURE 3. *Osphya azurea* **sp. nov. A** apex of penis and parameres, lateral view **B** apex of penis and parameres, dorsal view **C** aedeagus, lateral view **D** aedeagus, dorsal view **E** sternite IX **F** tergite VIII **G** sternite VIII **H** tergite VII **I** sternite VII. Scale bars = 0.2 mm for figs A, B, = 0.5 mm for figs C–I.

Based on the original description of *O. formosana* (Pic 1927b), this species is somewhat similar to the present new species for the weakly blue elytra and the predominantly dark antennae and legs. But it can be readily distinguished from *O. azurea* **sp. nov.** by elytra metallic hue much weaker, pronotum reddish yellow, elytra with denser whitish setae, and ventral surface of femora and tibiae brown.

The body form of the new species is also somewhat similar to some metallic species from the western Palaearctic Realm, such as *O. cylindromorpha* Abeille de Perrin, 1896, but it is different from them in the coloration of the pronotum and antennae, as well as the characters on the male metatibiae and genitalia.

Description. Based on unique male holotype (Fig. 1B). BL = 8.1 mm; body form much wider than previous new species. Head and pronotum black, with distinct lustre but not metallic; elytra vivid blue, with a distinct metallic hue. Labrum entirely pale yellow; clypeus black with a yellow apical margin; mandibles largely yellow, brown at apex; palpomeres brown. Antennae entirely dark, basal three antennomeres partly infuscate, others black. Head and pronotum covered with grayish white recumbent setae; elytra with more thickened whitish setae mixed with narrower blackish ones. Legs black, except claws which yellowish brown. Ventral side black, densely covered with grayish white recumbent setae.

Head large and wide; mandibles bifid at apex, both with an obtuse preapical tooth on inner margin, densely setose on outer surface; apical maxillary palpomere very strongly securiform, slightly shorter than two previous ones together. Antennae long and slender, A2 small, length about 1.8 times of its width; A3 about 2.0 times as long as A2; A4–A7 in similar length of A3; A8–A10 slightly shorter than the previous ones; A11 fusiform, gradually

tapered to apex.

Pronotum nearly semicircular, slightly wider than length (PW/PL = 1.28), wider than head (PW/HW = 1.22); lateral margins slightly arched near middle, more convergent near anterior angels which widely rounded, widest point clearly behind middle; posterior margin slightly curved in middle; posterior angles rounded-rectangular. Disc with evenly arranged punctures, distance between punctures generally slightly greater than their diameter; each puncture bearing a grayish white recumbent setae, these setae absent on central area (should be due to specimen not being well preserved). Lateral area explanate near posterior and anterior angles, weakly declining near anterior angles. All margins distinctly bordered; with a pair of well-defined latero-basal depressions, forming small triangular dimples connecting to posterior border.

Elytra narrow, lateral margins parallel, gradually narrowing and rounded to apical margin; more densely punctate than on pronotum, punctures equally dense and connected by short wrinkles except at apex. Elytra covered with two color of recumbent setae, whitish setae more thickened than blackish ones, they evenly intermingled across entire elytral surface. Scutellar shield triangular, densely covered with whitish setae.

Legs modified in males; meso- and metafemora thickened; mesotibiae curved without denticle or crenulation on inner margin; metatibiae more strongly curved, inner margin with a small obtuse denticle very close to apex, crenulate between basal third and apical denticle, outer margin evenly curved along its entire length (Fig. 1E); metatarsomere 1 in similar length of rest three tarsomeres together; all claws trident, middle branch slightly longer than lateral ones on pro- and mesoclaws (as in Fig. 1F), distinctly longer than them on metaclaws (as in Fig. 1G).

Male terminalia: Sternite VII elongate and tapered to apex (Fig. 3I); tergite VII trapezoid, apex truncate and weakly emarginate, with dense golden setae on apical fourth and a pair of oblique oval pilous patches on each side behind middle (Fig. 3H); sternite VIII bilobate, each lobe narrowly triangular and with long setae on inner-apical margin (Fig. 3G); apical margin of tergite VIII angulate in middle (Fig. 3F). Tegmen with basale about half length of apicale (Fig. 3C); middle portion of apicale clearly sinuate when in lateral view; apical cleft about a third length of apicale; parameres strongly hooked, but hooks shorter and slightly sharper than previous new species; apices of parameres with three long setae on notch before apical hook of dorsal margin, and some shorter setae on ventral margin (Fig. 3A). Penis arched near base, gradually sinuate near middle, apex capitate and gradually bent downward (Figs 3A, B).

Etymology. The scientific name of the new species is derived from the Latin roots "*azur-*", which means blue referring to the distinct metallic blue color for the new species.

Distribution. The new species is only known from the type locality Maji in Fugong County (Fig. 5, blue). The actual elevation of Maji Village is around 1400 m which quite different from that on the label. Thus, the specimen is inferred to be collected from mountains nearby.

Osphya clavata sp. nov. 棒角殿甲

https://zoobank.org/C45F1762-5139-431F-829B-4C9DB61ABFD1

Figs 1C; 4

Type. Holotype: male (CBFU): "Yunnan, Dehong Dai and Jingpo Autonomous Prefecture, Yingjiang County, Xima Town, 2024.V-VII, local collector" [in Chinese]

Diagnostic characters. BL = 4.7 mm; dorsum black without metallic hue, elytra with thickened recumbent setae forming whitish pattern; antennae, mouthparts, protibiae, and tarsi yellow; antennae claviform, gradually shortened and widened since A5; pronotum oval, lateral margins well rounded, latero-basal depressions hardly recognizable; legs not modified in males; male genitalia with unhooked parameres.

Comparison. The present new species is different from all other known species of the genus for the very special shape of its antennae. According to the original description, *O. albofasciata* Champion, 1916, from Assam, could be the closest relative of the new species. These two species are similar in the following important aspects:

pronotum oval and strongly transverse, with evenly arched lateral margins; A5 in similar length of A2; elytra with similar whitish pattern formed by thickened recumbent setae; antennae infuscate to apex. But the new species is different from *O. albofasciata* in the following aspect: (1) In *O. clavata* **sp. nov.**, pronotum entirely black with whitish recumbent setae; whereas in *O. albofasciata*, pronotum reddish brown. (2) In *O. clavata* **sp. nov.**, legs predominantly black except yellow protibiae and protarsi, whereas in *O. albofasciata*, all legs reddish brown. (3) In *O. clavata* **sp. nov.**, antennae shorter and claviform, gradually shortened and widened since A5, width of A6–A9 similar to their length; whereas in *O. albofasciata*, antennae longer and filiform, with apical antennomeres much longer than their width. (4) In *O. clavata* **sp. nov.**, A3 only slightly longer than A2; whereas in *O. albofasciata*, A3 much longer than A2. (5) In *O. clavata* **sp. nov.**, pronotum without a pair of well-defined latero-basal depressions; whereas in *O. albofasciata*, latero-basal depressions rather deep.

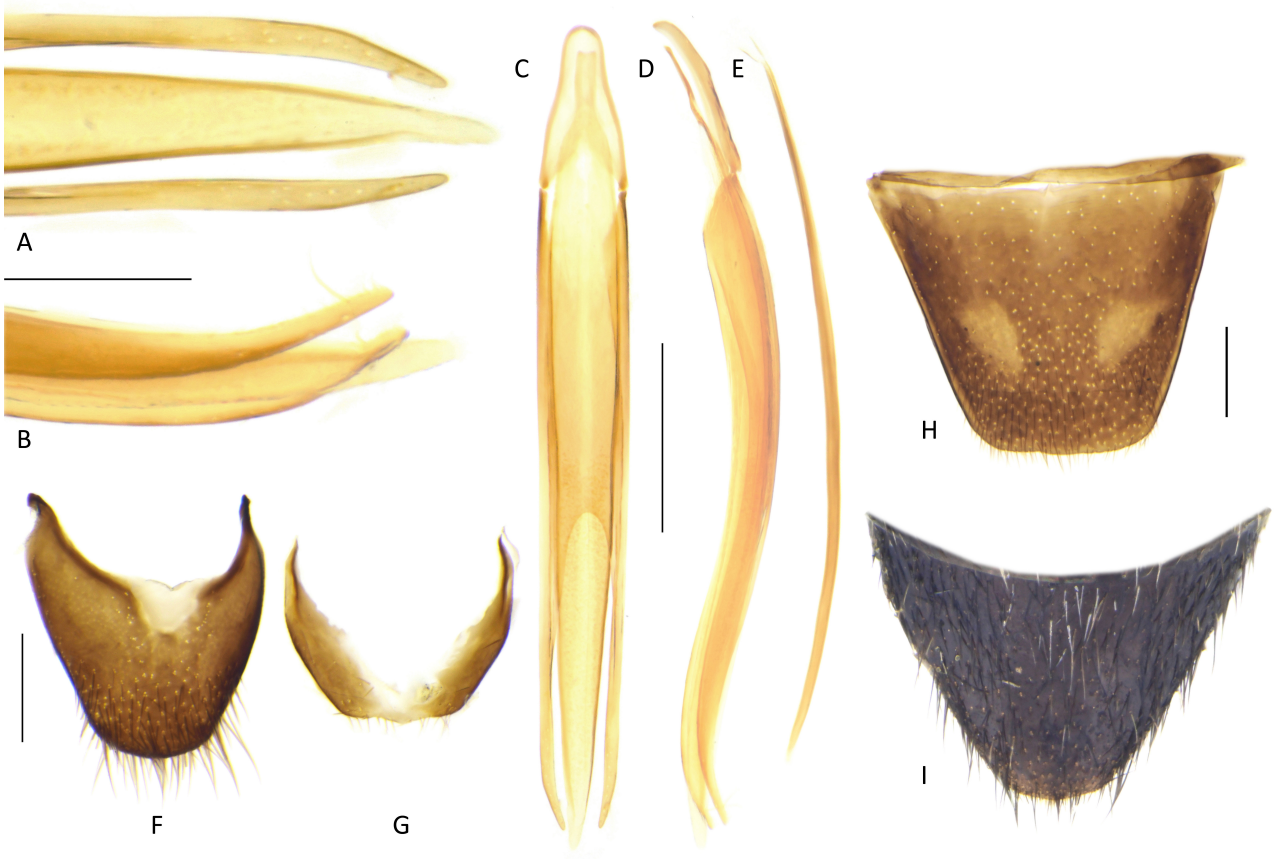

FIGURE 4. *Osphya clavata* **sp. nov. A** apex of penis and parameres, dorsal view **B** apex of penis and parameres, lateral view **C** aedeagus, dorsal view **D** aedeagus, lateral view **E** sternite IX **F** tergite VIII **G** sternite VIII **H** tergite VII **I** sternite VII. Scale bars = 0.5 mm for figs C–E, = 0.2 mm for figs A, B, F–I.

On the basis of the original description, *O. dissimilis* Champion, 1922, from Uttarakhand, could be also similar to the new species for their antennae both relatively short in compare to other species. *O. dissimilis* and *O. clavata* **sp. nov.** are the only two known species of the genus that have A3 only slightly longer than A2 (A3 more than twice length of A2 in other species) and apical antennomeres stout. But these two species are quite different in the following aspects: (1) In *O. clavata* **sp. nov.**, elytra with distinct whitish pattern formed by thickened recumbent setae; whereas without such thickened setae in *O. dissimilis*. (2) In *O. clavata* **sp. nov.**, A5–A10 distinctly widened, length of each antennomere subequal to its width; whereas in *O. dissimilis*, these antennomeres elongate. (3) In *O. clavata* **sp. nov.**, pronotal lateral margins evenly arched along their full length forming very widely rounded posterior angles; whereas in *O. dissimilis*, lateral margins trisinuate at base. (4) In *O. clavata* **sp. nov.**, termial

maxillary palpomere strongly securiform and slightly longer than two previous ones together; whereas in *O. dissimilis*, terminal maxillary palpomere rather short and subcultriform.

Besides these species mentioned above, there are only two other species of the genus in Asia that also have a distinct whitish pattern on elytra formed by thickened recumbent setae. They are *O. trilineata* Pic, 1910 and *O. orientalis* (Lewis, 1895). These two species are quite different from the present new species in the aspects of elytra pattern, pronotum shape, antennae color, and ratio of basal antennomeres.

Description. Based on unique male holotype (Fig. 1C). BL = 4.7 mm; body form relatively wide in genus. Dorsum predominantly black, with distinctly lustre but not metallic; antennae and palpomeres yellow, antennae slightly infuscate distal to A8; labrum black, mandibles brown at apex; protibiae and protarsi yellow, distal two protarsomeres darker than rest; all other parts of legs black. Head and pronotum covered with thickened whitish recumbent setae but not forming a certain pattern; elytra with distinct whitish pattern formed by thickened recumbent setae. Venter entirely black, with whitish recumbent setae on pleurae of pro-, meso-, and metathorax, and lateral sides of metacoxae.

Head large and wide; mandibles bifid at apex, both with a large preapical tooth on inner margin, outer margin with row of setae; terminal maxillary palpomere strongly securiform, slightly longer than two previous ones together. Antennae claviform, gradually widened to apex since A5; A1–A3 slender, A3 about 1.3 times as long as A2; A4 slightly widened to apex, slightly shorter than A2; A5–A9 strongly dilated and flattened, length of each antennomere subequal to its width; A8 and A9 largest, nearly quadrate; A10 narrower and less flattened than previous antennomeres; A11 wanting in only known specimen.

Pronotum distinctly transverse (PW/PL = 1.50), oval in overall shape, wider than head (PW/HW = 1.22). Lateral margins evenly arched along their full length, widest point slightly behind middle; posterior margin straight in middle; posterior angles widely rounded. Surface with evenly distributed punctures, distance between punctures generally subequal to their diameter; each puncture bearing a whitish or blackish recumbent setae; these setae absent on central area (it should be due to specimen not being well preserved). Lateral area widely explanate and declining, slightly warped on posterior angles. All margins distinctly bordered; without a pair of well-defined latero-basal depressions, but punctures very fine on where latero-basal depressions should be.

Elytra with lateral margins subparallel and slightly expanded near middle, gradually narrowing and rounded to apical margin; punctate with similar density to pronotum, punctures larger and more elongate near base, gradually turned to smaller and round punctures towards elytra apex. Elytra covered with two color of recumbent setae. Whitish setae more thickened and forming distinct pattern; setae incomplete in holotype but complete pattern should composed of a pair of small patches near humeral regions, a short strip near base of suture, two narrow transverse bands on basal fourth and apical two-fifth of elytra, and a narrow band on apical margin of elytra. Blackish setae not thickened, evenly distributed on elytra surface where whitish setae not occurred. Scutellar shield semicircular, densely covered with whitish setae.

Legs not modified in male, with all femora and tibiae narrow and straight; metatarsomere 1 in similar length of rest three tarsomeres together; claws trident, middle branch distinctly longer than lateral ones on all legs (Fig. 1G).

Male terminalia: Sternite VII elongate and tapered to apex (Fig. 4I); tergite VII trapezoid, apex truncate and not emarginate, with dark setae on apical fourth and a pair of oblique oval pilous patches on each side behind middle (Fig. 4H); sternite VIII semicircular, weakly sclerotized at center, apical margin weakly protruding in middle, with short setae on apical margin (Fig. 4G); apical margin of tergite VIII rounded-truncated in middle (Fig. 4F). Tegmen with basale about one-fifth length of apicale (Fig. 4C); middle portion of apicale clearly sinuate when in lateral view (Fig. 4D); apical cleft a little less than half length of apicale; parameres narrow and simple, apices digitiform, with a few of short setae near apex of dorsal margin (Figs 4A, B). Penis straight near base, gradually sinuate near middle, gradually narrowing to apex, apex simple and narrow (Figs 4A, B).

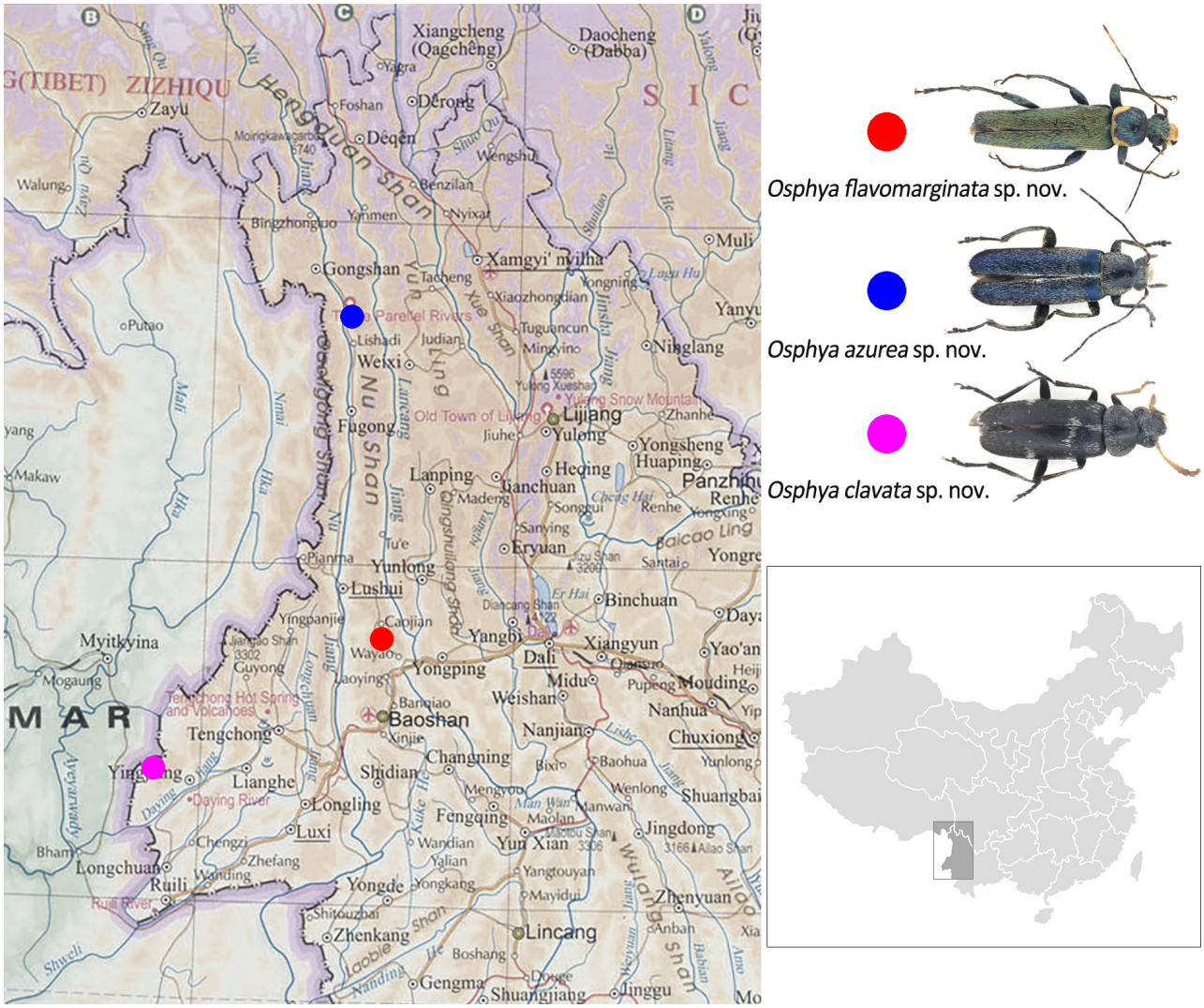

FIGURE 5. Distributions for *Osphya* species in western Yunnan.

Etymology. The scientific name of the new species is derived from the Latin root "*clav*-", which means claviform referring to the unique claviform antennae of the new species.

Distribution. The new species is only known from the type locality Xima in Yingjiang County (Fig. 5, magenta), on the westernmost point of Yunnan Province. The elevation is around 1400 m.

Remarks. The male genitalia of a very few species of *Osphya* from East and Southeast Asia have been described. However, compared with all species with known male genitalia worldwide, *O. clavata* **sp. nov.** is peculiar within the genus because of the apices of the parameres without teeth or hooks, the apex of the penis not capitate (Fig. 4B), and the basale very short (Fig. 4C). Moreover, the following male external characters also seem to be peculiar within the genus: antennae claviform, pronotum without latero-basal depressions, and legs not modified.

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